



US 20190278973A1

(19) **United States**

(12) **Patent Application Publication**
SETLAK et al.

(10) **Pub. No.: US 2019/0278973 A1**

(43) **Pub. Date: Sep. 12, 2019**

(54) **ELECTRONIC DEVICE INCLUDING PALM BIOMETRIC SENSOR LAYER AND RELATED METHODS**

(52) **U.S. CL.**
CPC **G06K 9/00087** (2013.01); **G06K 9/0004** (2013.01)

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **Dale R. SETLAK**, Merritt Island, FL (US); **Giovanni GOZZINI**, Berkeley, CA (US); **Mohammad YEKE YAZDANDOOST**, San Jose, CA (US)

(57) **ABSTRACT**

An electronic device may include a display layer including light transmissive portions and non-transmissive portions. The electronic device may also include a palm biometric image sensor layer beneath the display layer and configured to sense an image of a user's palm positioned above the display layer based upon light reflected from the user's palm passing through the light transmissive portions of the display layer. The electronic device may further include a controller configured to capture image data from the user's palm in cooperation with the palm biometric image sensor layer and determine a surface distortion of the user's palm based upon the image data. The controller may also be configured to perform a biometric authentication of the user's palm based upon the image data and the surface distortion.

(21) Appl. No.: **16/262,032**

(22) Filed: **Jan. 30, 2019**

Related U.S. Application Data

(60) Provisional application No. 62/640,917, filed on Mar. 9, 2018.

Publication Classification

(51) **Int. CL.**
G06K 9/00 (2006.01)

